

AMENDMENTS TO THE CLAIMS

1-50. (Cancelled)

51. (Currently Amended) A method of thermal analysis for determining an appropriate heating condition for heating an object introduced into and heated in a heating furnace in accordance with a required temperature profile, wherein said method comprises:

measuring a temperature at a measuring point of the object heated at each of a plurality of measuring locations of the heating furnace during a heating procedure for increasing the temperature of the object after introduction of the object into the heating furnace;

determining a heating characteristic at each of the measuring locations by using a heating temperature at the measuring location and the temperature measured at the measuring point of the object, the measuring location being a location through which the object passes along a transferring direction in the heating furnace; and

simulating a temperature profile of the object when a heating condition is changed by using the heating characteristic that is determined at each of the measuring locations.

A method according to claim 84,

wherein the heating characteristic at each of the measuring locations is an m-value defined by:

$$m = \frac{1}{t} \ln \left[\frac{T_a - T_{int}}{T_a - T_s} \right]$$

wherein ln is natural logarithm, T_a is heating temperature at the measuring location of the heating furnace, T_{int} is initial temperature at the measuring point of the object at the measuring

location, T_s is achieved temperature when the object is heated at the measuring location, and t is heating time at the measuring location.

52. **(Previously Presented)** A method according to claim 51, wherein the temperature T_s of the object is determined when the heating temperature T_a and the heating time t of the heating furnace are given, or the heating temperature T_a and the heating time t are determined when a required temperature T_s is given by using said m -values based on a following equation for heating:

$$T_s = T_a - (T_a - T_{int}) e^{-mt}$$

wherein e in the equation represents the base of natural logarithms.

53. **(Previously Presented)** A method according to claim 51, wherein said m -value is adjusted based on a predetermined equation of relationship between a blowing speed of heated air of the heating furnace and the m -value when the blowing speed of the heated air of the heating furnace is changed.

54-84. **(Canceled)**

85. **(Currently Amended)** A method of thermal analysis according to claim [[84]] 51, wherein the method further comprises:

making a judgment as to whether or not the simulated temperature profile of the object ~~to be heated~~ when the heating condition is changed satisfies a required temperature profile; and

determining the heating condition that satisfies the required temperature profile based on the judgment.